staff, partly to supplement university lectures, but partly also to give more individual instruction to the duller or idler students. One of the results of this system can be easily seen—the average graduate quits his university with the greatest affection for his college, but with little or nothing of that broader *esprit de corps* towards his university as a whole.

In America, on the other hand, each university has only one college preparing him for the B.A. degree. Consequently, a single American college, *e.g.* Harvard College, Cambridge, contains several thousand students.[1] The centre of social life can no longer be in the college; it is transferred to the class, the class consisting of all students who are in the same year. Each class elects its own president and other officers, has its various rowing, football, and baseball teams, and holds meetings for the discussion of matters of common interest. A class in Cambridge, Massachusetts, knits the students together in somewhat the same way as does a college in Cambridge, England, although, of course, far less closely.

In the second place, there is a comparatively large number of students in American universities, who intend to lead, or finally do lead, a business life after they leave college. It is true that just now the question is being raised whether a college training is the right one for an American business man, but the only probable outcome of this discussion will be an improved adjustment of the college curriculum in the interests of those who intend to embark on a business career. Already at Harvard there is a proposal on the part of the president to make it possible for such students to complete their training in a shorter time than the usual four years.

In the end these two American features, the formation of class ties and the presence of students who are intended for a business career, combine to place a number of wealthy *alumni* at the beck and call of the universities. It is a common occurrence for the class of a certain year to defray, wholly or in part, the cost of a building of which their *alma mater* stands in need; at Cornell alone twenty-two class-gifts of this or similar kind are on record. Moreover, the *alumni* of the various universities form themselves into societies, both local and general. Every important city in America contains various associations of *alumni*, each association representing one of the more important universities. The *alumni* of various classes, dispersed throughout the States, are periodically invited to revisit their university. In some universities they directly elect a certain number of their body to serve on the board of trustees or corporation of the university. Such is the hold exercised by many American universities on their former students.

But it is not only from wealthy *alumni*, but also from citizens who have never been to college, that the universities of the United States derive their greatest benefactions. Now this would be impossible unless the American people were in full sympathy with American university work. Indeed, the university holds as warm a place in the heart of the American as the hospital holds in that of the Englishman. He feels that it is a living organisation, not an inert out-of-date machine, which is doing necessary work in the advancement of the civilisation of his country. Further, we come to understand the reason of this feeling when we contrast the undergraduate courses at the two Cambridges. At Harvard, the examination for admission consists of papers in English, history, algebra, geometry, and natural science, Latin *or* Greek, and French *or* German. After passing this, the student has to choose four courses of lectures per year in *more than one* of the following subjects:—English, German, French, Italian, Spanish, history, government, economics, philosophy, fine arts, music, mathematics, engineering, or some natural science. Apart from certain reasonable restrictions, which prevent him from acquiring a too superficial knowledge in too many subjects, the student is at liberty to select just those courses which will best suit him in after life; and, of course, he can readily obtain advice in any difficulties that may beset him when making his choice. In his second and later years he may specialise more deeply in these and other subjects. He is examined twice a year, and shows thereby whether he is capable of proceeding to more advanced courses advantageously. He obtains his degree on the result of these bi-annual examinations. For an honours degree a thesis or special examination is required.

The undergraduate of our English Cambridge, on the other hand, having mastered at school the modicum of compulsory Greek required for the previous examination, has the choice of two distinct paths. He can straightway read for an honours degree in any *one* of the triposes which suits his requirements, the classical, mathematical, theological, natural sciences, mental and moral sciences, mechanical sciences, mediæval and modern languages, oriental languages, historical or other tripos—in which case he takes his degree almost always upon the results of a single examination in a single tripos at the end of his three years[1]; or he may be content to take an ordinary degree, for which he must devote at least the whole of his first year to Greek, Latin, English, algebra, statics, hydrostatics and heat, and spend his later years preparing for examination in any *one* subject (*inter alia*) of the following:—theology, economics, law, history, logic, mathematics, classics, music, chemistry, physics, botany, physiology, zoology, or agriculture. This examination, qualifying him for the ordinary B.A. degree, is completed at the end of his third year.

Few graduates who have been educated on the basis of a Cambridge tripos would welcome changes in so admirably conceived a system of education. At one time it was believed that the student who devoted his three or four years in this manner to a single subject must suffer in general culture, whereas it is nearer the truth to believe that there is scarcely any branch of learning which cannot impart a very high degree of culture, provided only that it be taught from a sufficiently wide and liberal point of view. On the other hand, there are probably few who would not desire considerable changes in the regulations for the ordinary degree. The examination is hardly more than an advanced Little-go, ending in a feeble effort at specialisation. Instead of having to spend a year or more at Greek, hydrostatics, heat, &c., why should it not be possible for the undergraduate who is bent on an army career to qualify in modern or oriental languages, geography, surveying, and ethnology, or for him who intends to enter into finance to study mercantile law, economics, and modern languages, or for the future country squire to read straightway in history, literature, law, and agriculture? Is a university to confine herself solely to the encouragement of research and to the preparation of ministers, teachers, physicians, engineers, and musicians? Or is it impossible to prepare men for other walks of life without the sacrifice of culture in the interest of practical needs? Surely America gives us a useful lesson as to the unwisdom of driving away such embryo financiers and others elsewhere owing to the lack of attractive and useful courses of study which they could pursue after leaving school. The expenses of administration in our universities increase so enormously from year to year that, unless they are to receive State aid or to decay from sheer stagnation, they must be continually appealing to the public for support. And public interest can only be maintained when the universities are prepared to equip men appropriately for many more different walks in life than they are at present. Such changes, which involve merely the framing of new regulations, cannot fail to be followed by an increase in benefactions, whereby training in languages, archæology, history, and economics may be improved, and the teaching and laboratories be alike brought to the requisite condition of efficiency for establishing a successful school of post-graduate research.

C. S. MYERS.

Gonville and Caius College, Cambridge.

An Ancient Lava Plug like that of Mont Pelée.

THE photograph of what is described as "a gigantic plug of solidified lava" in the centre of the new cone of Mont Pelée, which appears in NATURE of October 1 (p. 530),

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[1] The words college and university have thus acquired a significance in America which is unfamiliar to us. No college is regarded as a university unless, besides teaching, it encourages post-graduate research.

[1] No mention is here made of the still more specialised second part of the triposes which corresponds in many respects to the training given in the post-graduate schools of the better American universities.

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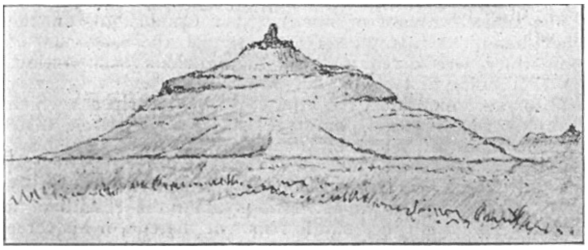
reminds me of similar columns of ancient lava not uncommon among the trap rocks of the Deccan, and I enclose a copy of a sketch I made of one of these in 1839, the re-



markable similarity of which to the column on Mont Pelée seems to be worthy of notice. A second similar column is seen in the distance on the right. RICHARD STRACHEY.

69 Lancaster Gate, W.

"Lessons on Country Life."

IN your issue of September 24 you published a review of "Lessons on Country Life," by Messrs. Buchanan and Gregory, but may I ask, with all deference, if your reviewer has not omitted to read an important part of this useful little book? He refers to Mr. Buchanan's earlier works, "Country Readers," Nos. 1 and 2, as "most excellent books for children," but had he read the *preface* to the "Lessons" he would have found that these were intended, not for children, but for teachers. Your reviewer truly says:—"Country life is a vast subject, so vast that no child can learn during his school life even a fraction of the information it may be desirable he should possess," and the same remark may be equally well applied to teachers. This book travels over much the same ground as "Reader" No. 1, but the matter is differently treated. In one case simplicity of language is aimed at, in the other the information is condensed, with a view, as it appears to me, of leaving it to the discretion of individual teachers to use such lessons, or portions of each lesson, as are most suitable to their own districts.

I do not wish wrongly to attribute ideas to the joint authors, but I fancy their intention is to put before rural teachers (many of whom have had little or no country training) as complete a summary as possible, taking it for granted that they would be able to pick out and study the essential parts.

This series of agricultural Readers and Lessons will, I think, do much to create a love of country life, may even help to counteract the attractions of town life. Rural depopulation is one of the most serious problems of the day, and if these books will assist, in only a small way, to arrest this migration, I feel sure you will not detract from their value by a few words which were probably due to a pardonable oversight.

A. H. H. MATTHEWS, Secretary.

Central Chamber of Agriculture, Broad Sanctuary Chambers, 20 Tothill Street, Westminster, S.W., September 30.

MR. MATTHEWS has hardly grasped the point of our notice—that Messrs. Buchanan and Gregory's book approaches the subject in the wrong spirit. The teacher is provided with a mass of indifferently selected information about farming matters, which he will pass on to his class instead of trying to lead it to observe and reason on its own account. The latter process is more difficult, but it happens to be education. We have of late had only too many occasions to deplore the "rural teachers with little or no country training" who hand out "condensed information" from little books about the country. It is this kind of instruction which offends both farmers and educationists, and if Mr. Matthews imagines it is going to counteract the attractions of town life and arrest rural depopulation, we can only hope that on this occasion he does not represent the opinion of the Central Chamber of Agriculture. THE REVIEWER.

CRATER LAKE IN OREGON.[1]

TWENTY years ago, as Mr. Diller informs us, this picturesque record of a strange episode in volcanic history was unknown to any but the Indians. It is still not very accessible, for it lies in an unfrequented region, deep set in the summit of the Cascade Range, some sixty-five miles north of the California line, but the United States Government, "recognising its worth as an educational feature," has already wisely secured it from the speculator and spoiler by making it a national park. An area of two hundred and fifty square miles is thus protected, of which we find a description in the present memoir. The first part, by Mr. Diller, deals with the geology and physical history of the great volcano, named after a local society Mount Mazama, which was shattered to form Crater Lake, and the second, by Mr. Patton, discusses the petrography of its rocks. It was virtually discovered by Captain Dutton, by whom and by Mr. Diller it has already been noticed; the U.S. Geological Survey has also published a special map, but the story is now completed in this excellently illustrated memoir.

The Cascade Range is largely, if not wholly, built up of volcanic material. In Cretaceous times it had no existence, "there flowed the sea"; this retreated during the Eocene, when vents opened in the Coast Range region, possibly also, though that is not yet quite certain, on the site of the Cascade. Here, however, volcanoes were in full activity during the Miocene, and built up a large part of the Range, where eruptions have continued almost to the present time. Post-Glacial outbursts occurred in some places, but seem to have ceased before history began, though hot springs and fumaroles show that the subterranean hearths are not yet cold. Some of the peaks rise above 10,000 feet, Mount Rainier even attaining 14,525 feet, and the surface of Crater Lake is rather more than 6200 feet above sea-level. It is an oval basin between twenty and twenty-one square miles in area, surrounded by cliffs which range from more than 500 to nearly 2000 feet in height, the ground falling more gradually from their rim to the present upland level. This great sheet of blue water, in places almost 2000 feet deep, is interrupted near its western margin by a pyramidal rocky mass, called Wizard Island, itself evidently a volcanic vent, and a study of the enclosing walls of the great caldera proves them to be built up in the usual way by ash-beds and lava-flows, dipping outwards from its axis, and riven by occasional dykes. The exterior slopes are dotted by parasitic cones, and exhibit occasionally moraines and Glacial striæ; they are also furrowed by valleys, which in some cases run up to and actually notch the edge of the cone, so that they evidently cannot have been formed on Mount Mazama as it now exists. They, like it, have been truncated, and the bowl occupied by Crater Lake has been formed by the destruction of a volcanic cone which must once have risen some six thousand feet above its present rim. Of this there can be no doubt; it is substantiated by numerous facts cited in this memoir, and we have only to study the geological map which it contains to see that the present lava streams are merely remnants of those discharged from sources at a greater elevation and nearer the central axis of the cone.

But the precise mode in which the upper part of the original Mount Mazama was destroyed, and Crater Lake formed among its ruins, is not quite so certain. Two explanations are possible. All the upper part of the mountain may have been hurled in shattered fragments through the air by a series

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[1] "The Geology and Petrography of Crater Lake National Park." By Joseph Silas Diller and Horace Bushnell Patton (U.S. Geological Survey). Pp. 168. Plates i–xix. (Washington, 1902.)

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